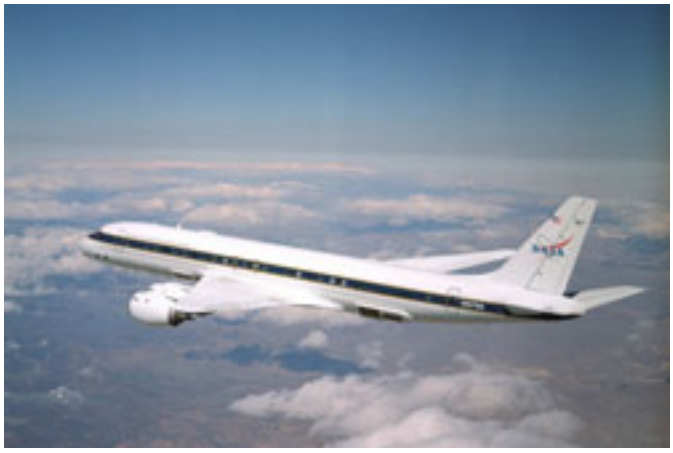
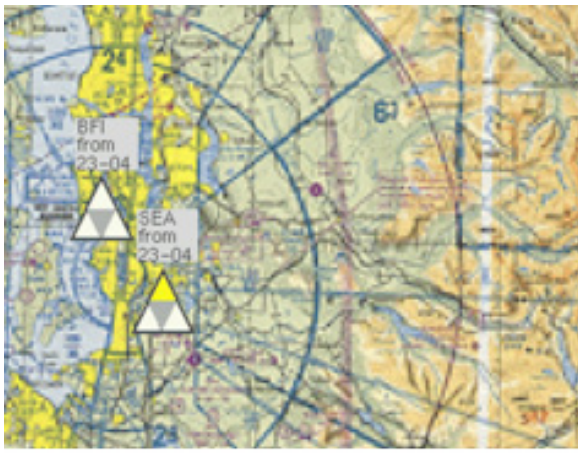
National Aeronautics and Space Administration

technology opportunity

# Intelligent Weather Agent

## A System Improves Weather Situational Awareness for Pilots






The NASA Ames Research Center offers the opportunity to license and codevelop Intelligent Weather Agent, an innovative method for in-flight weather briefing. With thousands of planes flying overhead in the U.S. at any given time, there is an urgent need for tools that help avoid fatal general aviation accidents. Loss of weather situational awareness by pilots causes the largest number of fatalities. Use of conventional in-flight briefing methods, such as receiving verbal updates from ground-based weather specialists, results in significant delays and shortened interactions due to long pilot queues. To address this problem, NASA Ames scientists developed a weather assistant that provides easy-to-interpret graphical representations of weather and wind data in a novel interaction format. IWA automatically monitors weather reports for the pilot's route of flight and warns him of detected anomalies. It anticipates the pilot's needs, analyzes weather trends and suggests alternative courses of action without requiring pilot direct action.

### Advantages

- Reduces risk of general aviation accidents by improving pilot situational awareness
- Better than state-of-the-art: decreases the pilot's effort required to maintain situational awareness by more than five times when compared to coventional methods
- Minimizes required in-flight visual attention by pilots

### Applications

- In-flight weather briefing to reduce aviation incidents
- Evaluation of an aircraft's flight-plan route using weather and wind information

## Technology Details

The IWA system automatically checks for availability of weather data updates and provides the original data and the updated data in several formats including an alphanumeric display, a graphical display and an audibly perceptible read-out. The displays provide present and forecast conditions over the time of the flight duration (automatically extracting the time-relevant forecast). Interaction methods include a verbal interface that allows the pilot to call up particular information verbally and obtain a verbal response. In addition to direct access to information, IWA includes a context-aware, domain and task knowledgeable assistant that interprets weather conditions and informs the pilot of unacceptable conditions and alternative actions. The assistant learns the pilot's needs and preferences through long-term interactions and can also be directly customized.

has published in many of these fields and holds four patents. Her current interest is in developing decision analysis tools to help flight controllers and astronauts make informed decisions in the face of uncertainty.

## Patents

This technology was patented (U.S. Patent Patent 7,129,857).

## Licensing and Partnering Opportunities

This technology is part of NASA's Innovative Partnerships Program, which seeks to transfer technology into and out of NASA to benefit the space program and U.S. industry. NASA invites companies to inquire about licensing possibilities for this technology for commercial applications.

## Selected Publications

1) Lilly Spirkovska and Suresh K. Lodha, "Context-aware Intelligent Assistant for Decreasing Pilot Workload," Journal of Aerospace Computing, Information, and Communication 2005, 1542-9423, 2(9), pp. 386-400, 2005.

2) Lilly Spirkovska and Suresh K. Lodha, "Context-Aware Intelligent Assistant Approach to Improving Pilot's Situational Awareness," NASA/TM-2004-212804, February 2004.

## For More Information

If you would like more information about this technology, please contact:

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